FLUGG Update

Brian Mercurio
MINOS/NOvA Beam WG Meeting
2013/7/26

Nimpwt Bug

- The bug regarding events with run = 0 and evtno = 0 was found to be two bugs.

    - The event number and run number are lost if the neutrino is produced inside a target volume.

    - An if section of the subroutine Fluscw was not always called when whoever wrote this version of FLUGG thought it would be called.

- The bug in Fluscw also caused Nimpwt to be 0 in about 0.5% of events.

- The proposed solution is to reset the importance weight in the user routine Stuprf.

- This was tested by comparing 500,000 POT of me000z200i before the fix to 500,000 POT after the fix.

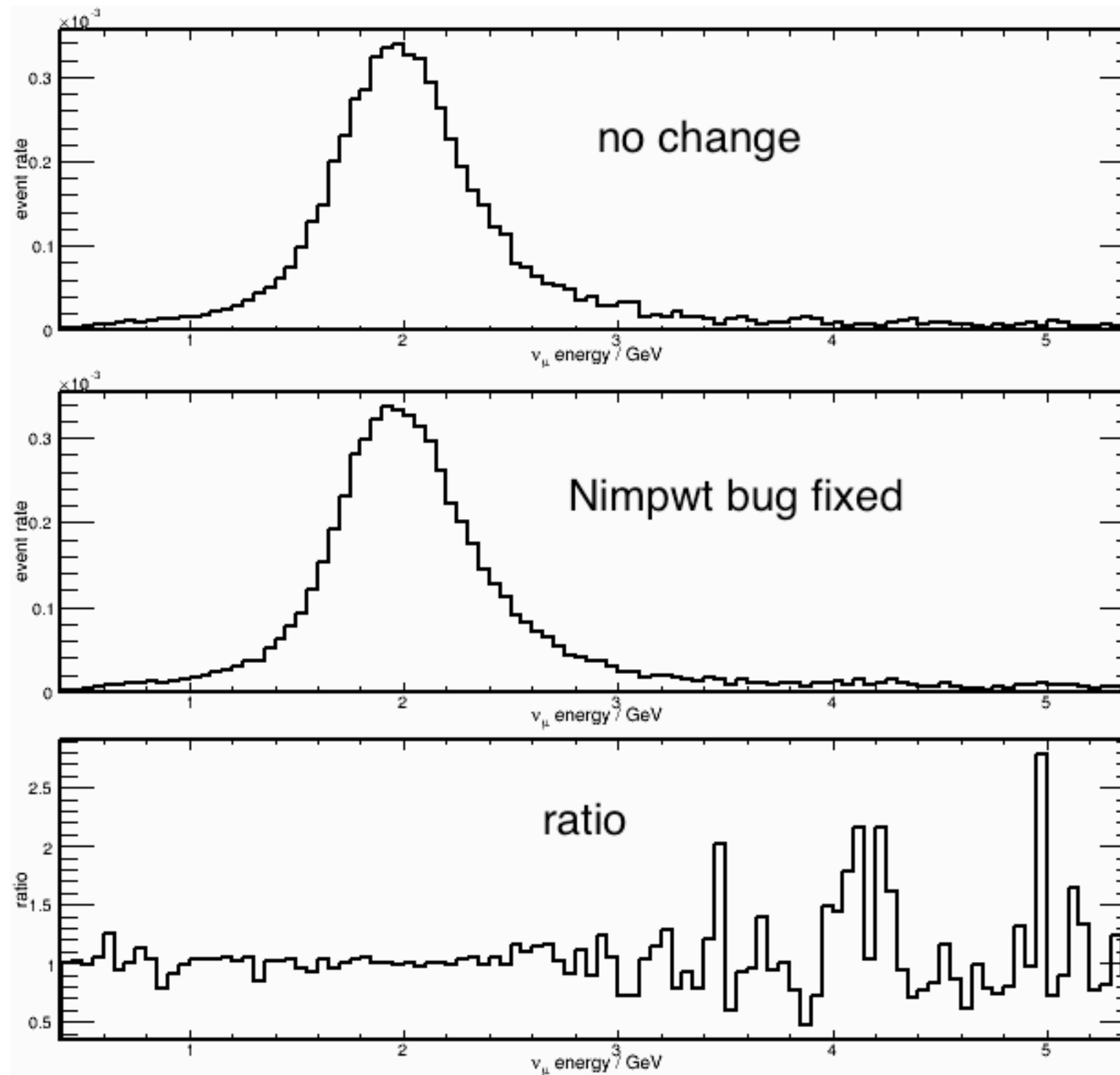- All histograms use energy and weight projected to the NOvA Far Detector.

$\nu_\mu + \nu_\mu$-bar when evtno = 0
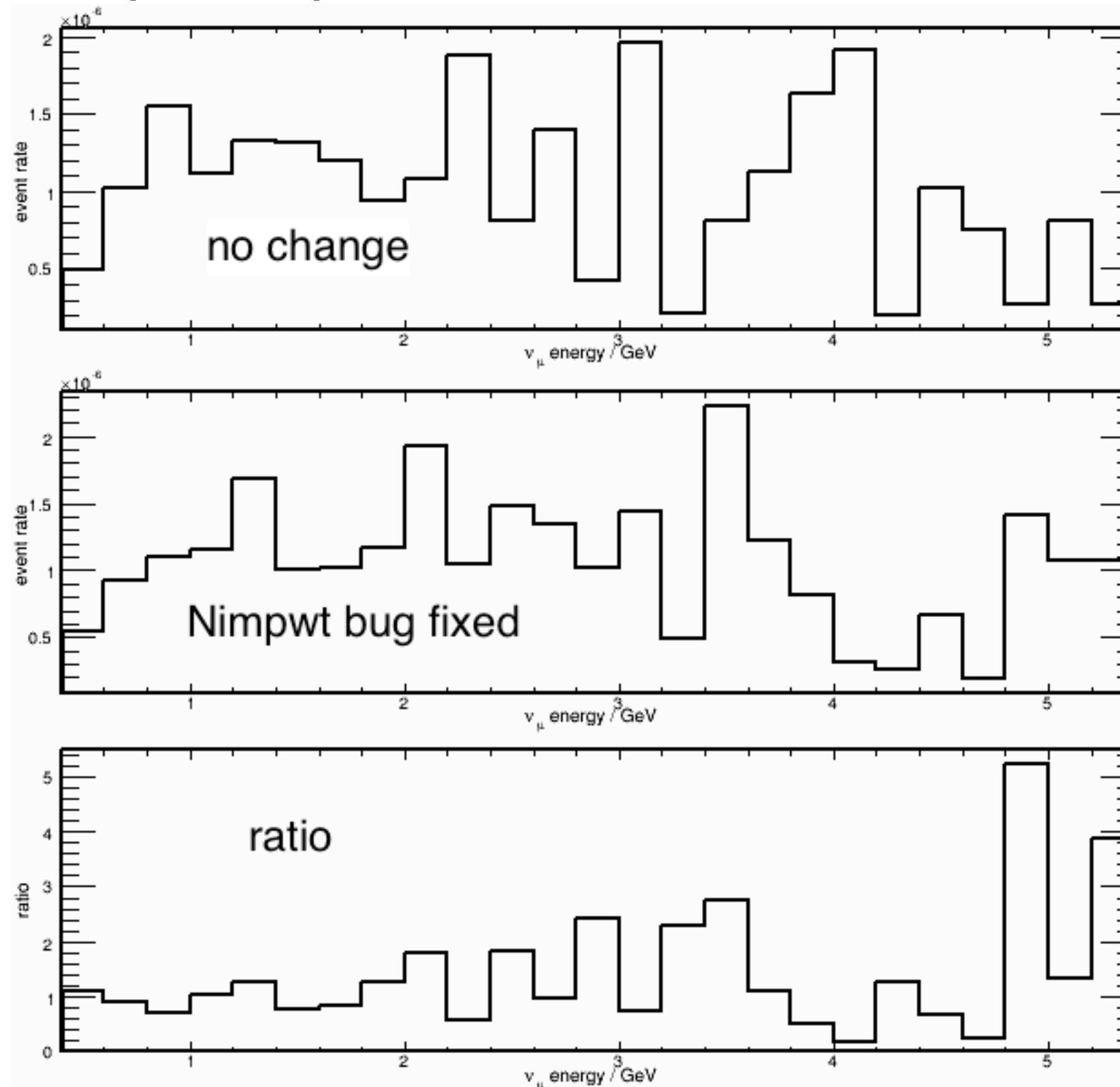
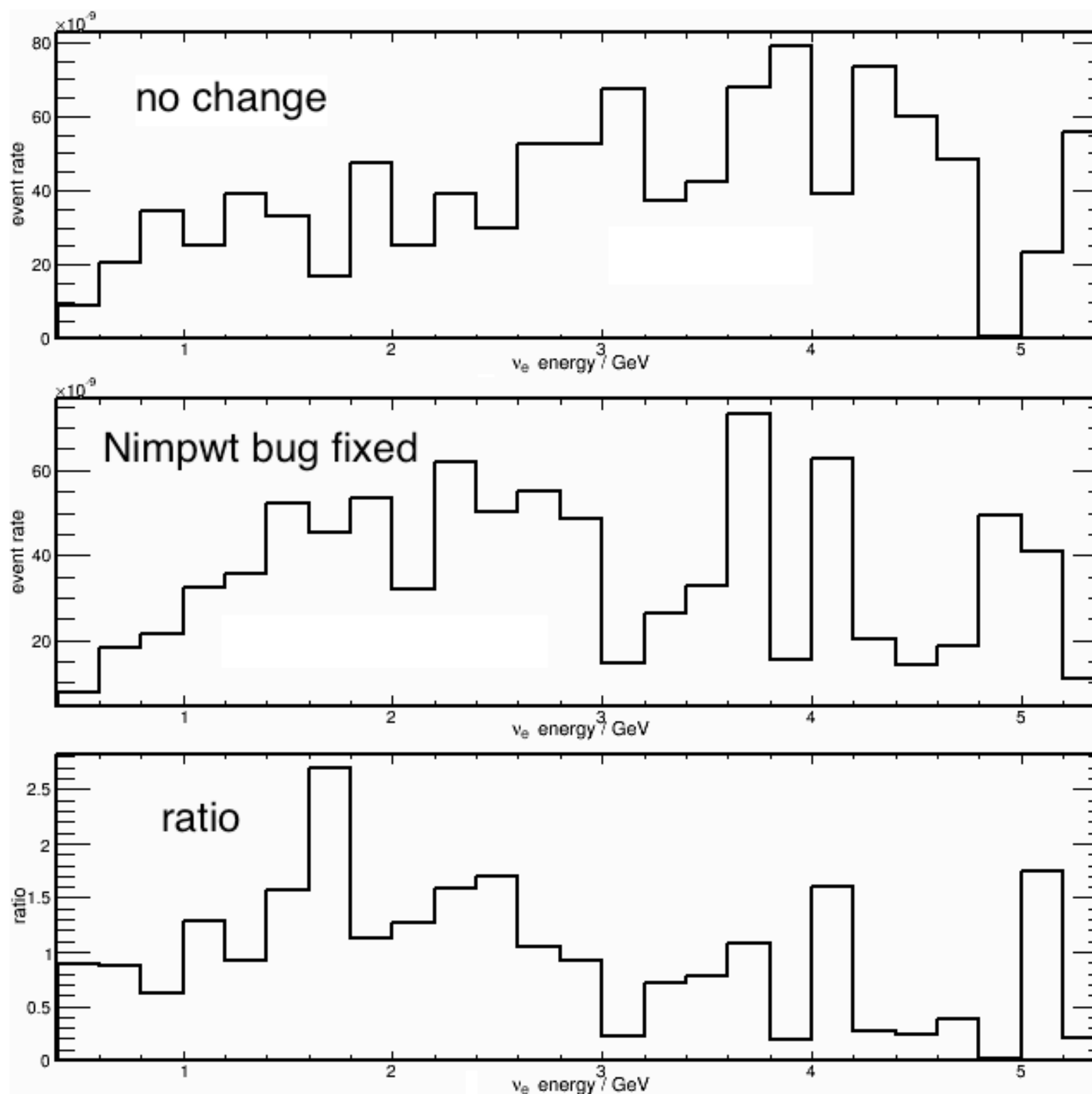- 2.55295e-05 events before the fix

- 2.65827e-05 events after the fix

ν_μ + ν_μ-bar when evtno > 0

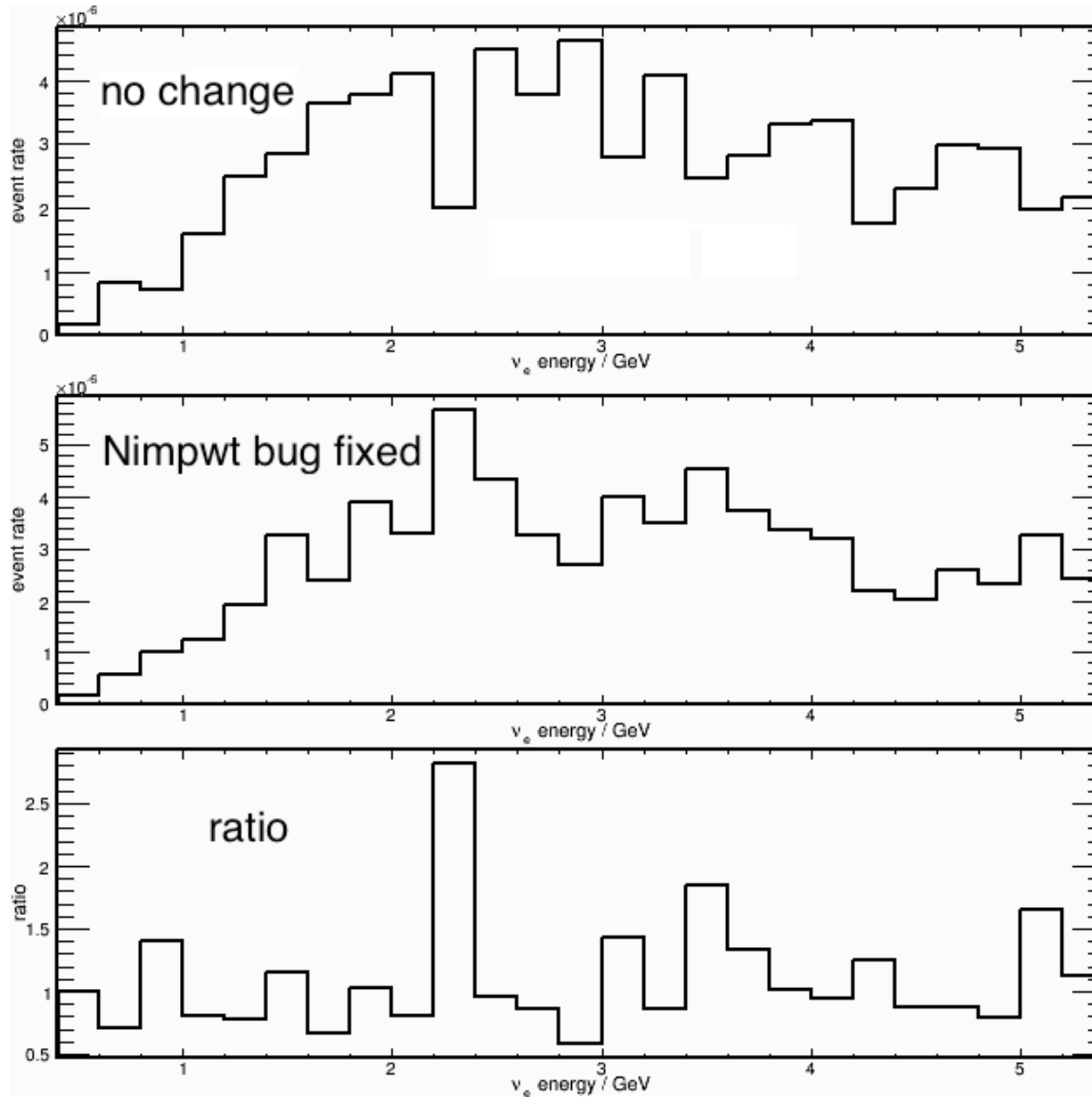- 0.00600907 events before the fix

- 0.00605427 events after the fix

$\nu_e + \nu_e$-bar when evtno = 0

- 1.01744e-06 events before the fix

- 8.94306e-07 events after the fix

$\nu_e + \nu_e$-bar when evtno > 0

- 6.79694e-05 events before the fix

- 7.09433e-05 events after the fix

Plans

- The Nimpwt bug fix caused no major changes to the neutrino flux.

  - ν_e or ν_μ

  - evtno = 0 or evtno > 0

- Are we ready to put the evtno bug fix back into FLUGG and commit the changes?